

CLAIMS

1. An electrode of a solid oxide fuel cell wherein:
the electrode comprises a skeleton constituted of a porous
5 sintered compact having a three dimensional network structure,
the porous sintered compact being made of an oxide ion
conducting material and/or a mixed oxide ion conducting
material;
grains made of an electron conducting material and/or
10 a mixed oxide ion conducting material are adhered onto the
surface of said skeleton; and
said grains are baked inside the voids of said porous
sintered compact under the conditions such that the grains
are filled inside the voids.

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2. The electrode of a solid oxide fuel cell according
to claim 1, wherein said porous sintered compact is made of
a material which has a composition represented by the following
formula:

20 $Ln_{1-x}A_xGa_{1-y-z}B1_yB2_zO_3 \dots (1)$

where

Ln = one or more of La, Ce, Pr, Nd and Sm;

A = one or more of Sr, Ca and Ba;

$B1$ = one or more of Mg, Al and In;

25 $B2$ = one or more of Co, Fe, Ni and Cu;

x = 0.05 to 0.3;

y = 0.025 to 0.29;

z = 0.01 to 0.15; and

y + z ≤ 0.3.

3. The electrode of a solid oxide fuel cell according to claim 1, wherein said porous sintered compact is made of
5 a yttria stabilized zirconia.

4. The electrode of a solid oxide fuel cell according to claim 1, wherein said porous sintered compact is made of a material having a composition represented by the following
10 formula, and the electrode is an air electrode:



where

15 Ln = one or more of La, Ce, Pr, Nd and Sm;
 A = one or more of Sr, Ca and Ba;
 B1 = one or more of Mg, Al and In;
 B2 = one or more of Co, Fe, Ni and Cu;
 x = 0.05 to 0.3;
 y = 0 to 0.29;
 0.15 < z ≤ 0.3; and
20 y + z ≤ 0.3.

5. The electrode of a solid oxide fuel cell according to claim 1, wherein said porous sintered compact is made of a material having a composition represented by the following
25 formula, and the electrode is an air electrode:



where

A' = one or more lanthanoid metals each having the 8 coordination ionic radius of the trivalent ion ranging from 1.05 to 1.15 Å;

B' = one or more of Co, Fe, Ni and Cu;
5 x' = 0.05 to 0.3; and
 y' = 0.05 to 0.3.

6. The electrode of a solid oxide fuel cell according to any of claims 1 to 3, wherein said grains comprise at least 10 one of Ni, Co, Ce_{1-m}C_mO₂ (C is one or more of Sm, Gd, Y and Ca; m = 0 to 0.4), and the electrode is a fuel electrode.

7. The electrode of a solid oxide fuel cell according to any of claims 1 to 5, wherein said grains are made of at 15 least one selected from a group of the materials based on LaMnO₃, LaCoO₃, SmCoO₃ and a PrCoO₃, and the electrode is an air electrode.

8. An electrode/electrolyte laminate for a solid oxide 20 fuel cell, wherein the electrode according to any of claims 1 to 7 is integrally formed on one surface of an oxide ion conducting, dense solid electrolyte layer.

9. An electrode/electrolyte laminate for a solid oxide 25 fuel cell, wherein the electrode according to any of claims 1 to 3 is integrally formed on both surfaces of an oxide ion conducting, dense solid electrolyte layer.

10. An electrode/electrolyte laminate for a solid oxide fuel cell, wherein the electrode according to any of claims 1 to 5 or claim 7 is integrally formed on one surface of an oxide ion conducting, dense solid electrolyte layer; and the 5 electrode according to any of claims 1 to 3 or claim 6 is integrally formed on the other surface of the oxide ion conducting, dense solid electrolyte layer.

11. The electrode/electrolyte laminate for a solid oxide 10 fuel cell according to any of claims 8 to 10, wherein the skeleton of the electrode and the solid electrolyte layer are made of the same material or the same type of material.

12. A solid oxide fuel cell, wherein the fuel cell 15 comprises an air electrode and/or a fuel electrode each consisting of the electrode according to any of claims 1 to 7.

13. A solid oxide fuel cell, wherein the fuel cell 20 comprises the electrode/electrolyte laminate according to any of claims 8 to 11.